



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240



JUL 29 2010

MEMORANDUM

To: Chief, Division of Management Authority

From: Chief, Division of Scientific Authority *Rebecca A. Anderson*

Subject: General advice for exports of artificially propagated specimens of American ginseng (*Panax quinquefolius*) including field-cultivated and woods-grown/woods-cultivated specimens.

This general advice supersedes the "General Advice for Exports of Artificially Propagated American Ginseng including Woodsgrown and Woods-cultivated Specimens" issued by the Division of Scientific Authority (DSA) on August 8, 2006.

Based on our analysis of available information, we continue to find roots of American ginseng (*Panax quinquefolius*) grown using field-cultivated and woods-cultivated methods qualify as artificially propagated according to the criteria of Resolution Conf. 11.11 (Rev. CoP15), *Regulation of trade in plants*, of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Specimens of artificially propagated American ginseng include live and dead plant material as well as whole and sliced roots and parts of roots. This general advice covers the export of artificially propagated specimens of any age grown in the following States: Alabama, Arkansas, Georgia, Idaho, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

This general advice does not apply to specimens of American ginseng grown under wild-simulated conditions. We continue to find roots grown under wild-simulated conditions do not meet the criteria of artificially propagated plants as defined in Resolution Conf. 11.11 (Rev. CoP15). Specimens of wild-simulated American ginseng are covered under the non-detriment finding for wild American ginseng.

We will continue to monitor annual State harvest reports and export data compiled by the Division of Management Authority for artificially propagated specimens of American ginseng, with the understanding that this general advice may be modified in the future, if deemed necessary, based on any new pertinent information that becomes available.

American ginseng is hereafter referred to as "ginseng."



Basis for advice:

1. Ginseng (*Panax quinquefolius* L.) is a long-lived herbaceous perennial of the Araliaceae family. The species is native to eastern deciduous forests of North America, occurring from southern Canada (Ontario and Quebec) west to South Dakota and Oklahoma, and south to Georgia (NatureServe 2010). The States Idaho, North Dakota, Oregon, and Washington, included in this general advice, are outside the species' range. Ginseng is a shade dependent species requiring 70–90 percent shade in its natural forest environment (Anderson et al. 2002).
2. Ginseng was included in Appendix II of CITES in 1975. Since its listing, U.S. exports of roots of artificially propagated plants have consistently exceeded exports of wild-harvested roots. From 1998 to 2008, exports of roots of artificially propagated ginseng amounted to 92.8 percent (8,816,636 pounds) of the total ginseng roots (9,495,935 pounds) exported from the United States (DMA 2009). Although artificially propagated roots include both field-grown and woods-grown/woods-cultivated roots, the vast majority of these roots are field-grown given the higher production yields per acre compared to woods-grown/woods-cultivated roots.
3. Roots of field-cultivated and woods-grown/woods-cultivated plants are distinct from roots of wild-simulated and wild ginseng plants. Cultivated roots are typically cream colored, smooth in texture, and bigger in size with few if any concentric rings (i.e., stress rings) that are typical of wild-simulated and wild roots (Hankins 1997; <http://www.wvu.edu/~agexten/forestry/ginseng.htm>, accessed June 30, 2010).
4. This finding is based on our evaluation of the known cultivation practices and techniques used to produce field-cultivated and woods-grown/woods-cultivated ginseng in the United States.

Field-cultivated ginseng

5. Field cultivation of ginseng began in the late 1800s as an alternative to wild harvest of roots (USDA 1928; Williams 1957). In the early 1900s, the U.S. Department of Agriculture promoted field cultivation of ginseng as a commercially viable business opportunity (USDA 1928). In 1901, there were approximately 20 acres of field-cultivated ginseng in commercial production in the United States (USDA 1928), by 1997, there were approximately 3,800 acres in production (Hankins 1997).
6. Wild-collected ginseng seeds and root transplants were originally collected for commercial field plantings and home gardens (Boehm et al. 1999; Proctor et al. 1999). Further expansion of cultivated ginseng was achieved by the availability

of seeds produced from field-cultivated plants. During the 1950s and 1960s, commercial field operations in Wisconsin produced the vast majority of ginseng seeds in the United States (Persons and Davis 2005).

7. Wisconsin, mainly Marathon County, is the center for field-cultivated ginseng, producing 95 percent of the cultivated ginseng in the United States (Hankins 1997; Milwaukee Journal-Sentinel 2010; Small and Catling 1999; Persons and Davis 2005). There are approximately 200 growers in Wisconsin that grow about 1,400 acres of field-cultivated ginseng (Milwaukee Journal-Sentinel 2010). Whereas the United States was once the world's largest producer of field-grown ginseng, over the last decade the acreage in production has dramatically decreased due to competition from Canada, China, and South Korea (Persons and Davis 2005).
8. Roots grown under field cultivated conditions grow quickly to a marketable size and are harvested when plants are 3 to 5 years of age (Beyfuss 1999; <http://www.pubs.ext.vt.edu/354/354-312/354-312.html>, accessed June 30, 2010). Field cultivated root yields range 2,000 to 4,000 pounds of dried roots per acre (Hankins 1997; Brun 1999).

Woods-grown/woods-cultivated ginseng

9. The production of woods-grown/woods-cultivated ginseng provides an alternative source of ginseng roots to the export market. Woods-grown/woods-cultivated ginseng is grown in prepared beds or rows in a modified forest environment. Interest in growing woods-grown/woods-cultivated ginseng has increased substantially since the mid-1990s (Persons and Davis 2005). Information on cultivation methods and techniques are widely available through a variety of media outlets (e.g., written publications, Internet web sites) and are promoted through State extension offices, land-grant universities, local community organizations, and ginseng growers' associations (Pritts 1995; Carmen et al. 2005; Persons and Davis 2005; <http://www.uky.edu/Ag/NewCrops/introsheets/ginsengintro.pdf>; <http://www.hort.purdue.edu/newcrop/newcropsnews/94-4-1/ginseng.html>; <http://www.wvu.edu/~agexten/forestry/ginseng.htm>; <http://www.pubs.ext.vt.edu/354/354-312/354-312.html>; and <http://www.ces.ncsu.edu/depts/hort/hil/pdf/ag-323.pdf>, accessed June 30, 2010).
10. To obtain high quality woods-grown/woods-cultivated roots, plants are typically grown for 5 to 8 years so that roots reach sufficient size for the international market (Beyfuss 1999; Persons and Davis 2005; <http://www.uky.edu/Ag/NewCrops/introsheets/ginsengintro.pdf>, accessed June 30, 2010; <http://www.wvu.edu/~agexten/forestry/ginseng.htm>, accessed June 30, 2010). According to Persons and Davis (2005), half an acre of densely planted woods-grown ginseng plants can produce 300 pounds of dried roots.

Determination of artificially propagated cultivated ginseng

11. The definition of “artificially propagated” specimens according to CITES Resolution Conf. 11.11 (Rev. CoP15), *Regulation of trade in plants*, is the following:

- a) grown from seeds, cuttings, divisions, callus tissues or other plant tissues, or other propagules under controlled conditions; and that ‘controlled conditions’ means in a non-natural environment that is intensively manipulated by human intervention for the purpose of plant production.

General characteristics of controlled conditions may include but are not limited to tillage, fertilization, weed and pest control, irrigation, or nursery operations such as potting, bedding or protection from weather;

Growers of field-cultivated and woods-grown/woods-cultivated ginseng typically plant seeds that have been artificially stratified. Artificial stratification is used to approximate the natural soil conditions by exposing ginseng seeds to cold/warm/cold sequence of seasonal temperature changes. A typical method of stratification is to plant ginseng seeds in the fall in moist sand in wood boxes where they are protected outdoors for 12 to 18 months

(<http://www.sfp.forprod.vt.edu/factsheets/ginseng.pdf>; accessed July 2, 2010).

Growers of woods-grown/woods-cultivated ginseng are also known to plant 1 to 3-year-old cultivated transplant roots (rootlets). Growers can readily purchase stratified seeds produced from cultivated plants and cultivated roots for planting (Beyfuss 1999).

Field-cultivated ginseng:

Field-cultivated ginseng is a labor intensive crop grown under controlled conditions using common horticultural practices including soil tillage, fertilization, weed control, irrigation, and pesticides. Specialized tractors, sprayers, and mechanical harvesters are common on larger field operations.

Ginseng plants are grown in densely planted raised beds under 70–80 percent artificial shade provided by wood lath or black polypropylene shade cloth (Beyfuss 1999; <http://www.uky.edu/Ag/NewCrops/introsheets/ginsengintro.pdf>; accessed June 30, 2010).

Woods-grown/woods-cultivated ginseng:

Woods-grown/woods-cultivated ginseng refers to ginseng that is intensively grown using a forest farm or agroforestry system under the natural forest canopy of 70–80 percent shade (Scott et al. 1995; Beyfuss 1999; Persons and Davis 2005). Cultivation techniques include soil tillage, fertilization, weed control, and the use of pesticides.

Site preparation typically includes clearing the understory vegetation and debris and tilling the soil at a depth of 4–8 inches either by rototiller or manual methods in the selected area (Scott et al. 1995; Beyfuss 1999; Persons and Davis 2005; <http://www.uky.edu/Ag/NewCrops/introsheets/ginsengintro.pdf>;

<http://www.hort.purdue.edu/newcrop/newcropsnews/94-4-1/ginseng.html>;
<http://www.sfp.forprod.vt.edu/factsheets/ginseng.pdf>; accessed June 30, 2010).

Depending on the specific site location, soil amendments including limestone, gypsum, and chemical or organic fertilizers are added to the soil as necessary (Davis 1997; Beyfuss 1999; Das et al. 2001; Persons and Davis 2005; <http://www.ext.vt.edu/pubs/forestry/354-312/354-312.html>; accessed June 30, 2010). Seeds or transplant roots are planted in raised beds or tilled rows (Persons and Davis 2005; <http://www.uky.edu/Ag/NewCrops/introsheets/ginsengintro.pdf>; <http://www.hort.purdue.edu/newcrop/newcropsnews/94-4-1/ginseng.html>; accessed June 30, 2010). Pesticides are applied, as necessary for insect and disease control (Beyfuss 1999; Persons and Davis 2005).

b) grown from seeds, cuttings, divisions, callus tissues or other plant tissues, spores or other propagules that either are exempt from the provisions of the Convention or have been derived from cultivated parental stock grown under controlled conditions, and the cultivated parental stock used for artificial propagation is, to the satisfaction of the designated CITES authorities of the exporting country:

- i) established in accordance with the provisions of CITES and relevant national laws and in a manner not detrimental to the survival of the species in the wild; and
- ii) maintained in sufficient quantities for propagation so as to minimize or eliminate the need for augmentation from the wild, with such augmentation occurring only as an exception and limited to the amount necessary to maintain the vigor and productivity of the cultivated parental stock.

All of the States covered in this advice have promulgated laws to regulate field-cultivated ginseng farms. Such farms operate in accordance with all applicable State and Federal regulations. Growers of woods-cultivated ginseng must also abide by all applicable State and Federal laws and regulations. Additionally, all States covered under this advice have provided the Division of Management Authority sufficient information to meet the requirements of the Code of Federal Regulations (CFR): 50 Part 23 Section 68—American ginseng. This regulation states the federal requirements for inclusion in the State export program for ginseng. Specifically, States must provide sufficient information to ensure that ginseng harvested within its jurisdiction is legally acquired; that it has the resources to determine whether ginseng grown within its jurisdiction is artificially propagated or wild-collected; and has procedures in place to minimize the risk that the roots of wild-collected plants would be claimed as artificially propagated roots.

Field-cultivated ginseng:

Seeds of field-cultivated ginseng are harvested for out-planting and excess seeds

are offered for sale. Field-cultivated ginseng plants require a minimum of 3 years to produce sufficient quantity of seeds for out planting. An average acre of field-cultivated plants can produce more than 200 pounds of seed per year (Persons and Davis 2005). There are approximately 6,000 to 8,000 ginseng seeds per pound (Pritts 1995; Beyfuss 1999; Persons and Davis 2005). The optimum seeding rate for field-cultivated ginseng is between 80 to 100 pounds of seed per acre (Brun 1999; Persons and Davis 2005).

Woods-grown ginseng:

Growers of woods-grown/woods-cultivated ginseng also harvest their seeds for out-planting and excess seeds are offered for sale. An average acre of 4-year-old or older plants can produce 50 pounds or more of seeds per year (Persons and Davis 2005).

12. In summary, ginseng roots produced using field-cultivated and woods-cultivated methods in the States covered under this finding, clearly qualify as artificially propagated specimens according to the definition of Resolution Conf. 11.11 (Rev. CoP15). Cultivated ginseng that does not meet the requirements of artificially propagated will be considered wild for export purposes.

References Cited:

- Anderson, R.C., M.B. Anderson, and G. Houseman. 2002. Wild American ginseng. *Native Plants Journal* 3(2):93-105.
- Beyfuss, R. L. 1999. Agroforestry Notes 14. USDA Forest Service and USDA Natural Resources Conservation Service.
- Boehm, C. L., H. C. Harrison, G. Jung, and J. Nienhuis. 1999. Organization of American and Asian ginseng germplasm using randomly amplified polymorphic DNA (RAPD) markers. *Journal American Society Horticulture Science* 124:252–256.
- Brun, C. A. 1999. On-line guide to ginseng production in the Pacific Northwest. Washington State University Cooperative Extension. Available at: www.tricity.wsu.edu/~cdaniels/profiles/ginseng.pdf. Accessed June 30, 2010.
- Carman, D. C., D. Myles, M. R. Morales. 2005. Ginseng cultivation and conservation practices. Mountain State University. Beckley, West Virginia.
- Division of Management Authority, U.S. Fish and Wildlife Service. 2006. U.S. exports of American ginseng 1992–2004. Arlington, Virginia.
- Hankins, A. 1997. Wild-simulated ginseng cultivation. Temperate Agroforester January. Virginia State Cooperative Extension, Virginia State University, Petersburg, Virginia.

- Milwaukee Journal-Sentinel. 2010. Extreme Spring Weather Kills Valuable US Ginseng Crop For Chinese Export. Available at: <http://www.jsonline.com/business/93742354.html>. Accessed July 6, 2010.
- NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.6. NatureServe, Arlington, Virginia. Available at: <http://www.natureserve.org/explorer/>. Accessed June 30, 2010.
- Persons, W. S. and A. M. Davis. 2005. Growing and marketing ginseng, goldenseal and other woodland medicinal. Bright Mountain Books, Inc. Fairview, North Carolina.
- Pritts, K. D. 1995. Ginseng: how to find, grow, and use America's forest gold. Stackpole Books, Mechanicsburg, Pennsylvania.
- Proctor, J. T. A., D. C. Percival, and D. Louttit. 1999. Inflorescence removal affects root yield of American ginseng. HortScience 34(1): 82–88.
- Small, E. and P. M. Catling. 1999. Canadian Medicinal Crops. Natural Research Council Research Press. Ottawa, Canada.
- USDA (U.S. Department of Agriculture). 1928. Farmers bulletin No. 1184. Available at: <http://www.wvu.edu/~agexten/forestry/oldsang.htm>. Accessed June 30, 2010.
- Williams, L. O. 1957. Ginseng. Economic Botany 11(4):344–348.